

Extractive and Mining waste: potential implications connected to their sustainable recovery



Dr. Giovanna Antonella Dino

Earth Sciences Department, University of Torino. Italy

Abstract

The rapid development of mining exploitation activities have produced huge quantity of extractive wastes (EW) which provides opportunity as potential resource for extracting raw material (RM). The current study focuses on a shared methodology to recover EW from abandoned mines, which consist of: collection of historical information about geological and mining setting, EW characterization, evaluation of the volume of EW, laboratory test to define the best dressing techniques to exploit recoverable minerals, production of artificial substrate for agricultural purposes.

The presented investigation, tested for three case studies in Northern Italy, frames the opportunities for realizing a sustainable and resilient circular economy for EW management, that needs advancements in filling the knowledge gaps of the factors which affect the way waste is managed. The

present work highlights the opportunity to consider EW facilities as “ore bodies” to exploit. Recovery of RM and production of artificial substrate can lead to the remediation of the investigated area, decrementing the environmental impacts associated to EW facilities. Thus, the recovery of RM and reclamation operations can be strategically integrated for the requalification and future management of the damaged area. By combining valorization of materials with land re-use, cost efficient resource recovery of EW facilities will generate economic, environmental and social spill-over. Technology development has the potential to turn lower-grade materials into a RM source and make the whole RM valuable; in addition minor metals could be recovered, and the residual mineral matrix has the potential to be used in the mine as geopolymers or in novel applications.

Biography

Graduated in Mining Engineering (Politecnico di Torino) and qualified as mining engineer since 2001. PhD course in Environmental Geoengineering (DIGET – Politecnico di Torino) ended in 2004: the research was about environmental problems connected to extractive industry and to potential recovery of extractive waste.

At present, she is working at University of Torino (Earth Sciences Department) as research assistant, interested in quarrying and mining activities (exploitation, application of stones in historical contexts and cultural heritage, working and dressing activities, extractive waste management and potential recovery, environmental impacts associated to mining activities).

Responsible of Mineral Dressing and Sampling Laboratory at Earth Sciences Department.

Involved from 2005 in several studies concerning exploitation of natural and dimension stones ; furthermore, from 2001 she has been involved in projects which deals with the impacts, the management and the potential reuse of mining and quarrying waste.

She co-chair scientific sessions at international conferences (EGU, SUM, Sardinia Symposium) about circular economy and landfill mining, resource efficiency and sustainable mining in extractive industry.

She published more than 100 scientific papers and abstracts, presented during National and International Conferences or published in scientific journals, and has been

serving as an editorial board member of *repute* (Resources Policy, Science of the Total Environment, Sustainability).